

CLAIMS:

1. An exposure apparatus comprising:
a projection optical system for projecting a
5 pattern of a mask onto a substrate; and
a fluid supply unit for supplying a fluid
between said projection optical system and the
substrate, said fluid supply unit including an
injection unit for injecting carbon dioxide into the
10 fluid.
2. An exposure apparatus according to claim 1,
wherein said fluid supply unit includes a degassing
unit for degassing the fluid, said degassing unit being
15 located at an upstream side of the injection unit.
3. An exposure apparatus according to claim 1 or
2, wherein said injection apparatus includes a membrane
module for injecting the carbon dioxide.
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4. An exposure apparatus according to any one of
claims 1 to 3, wherein the injection unit injects the
carbon dioxide at a concentration of the carbon dioxide
in the fluid between 0.02 ppm and 750 ppm.
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5. An exposure apparatus according to claim 4,
wherein the injection unit injects the carbon dioxide

at the concentration of the carbon dioxide in the fluid between 0.06 ppm and 300 ppm.

6. An exposure apparatus according to any one of
5 claims 1 to 3, wherein the fluid supply unit includes a resistivity meter for measuring a resistivity value of the fluid, and the injection unit injects the carbon dioxide based on a measurement result of the resistivity meter.

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7. An exposure apparatus according to any one of claims 1 to 3 and 6, wherein the injection unit injects the carbon dioxide so that a resistivity value of the fluid is between 0.02 MΩ·cm and 10 MΩ·cm.

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8. An exposure apparatus according to claim 7, wherein the injection unit injects the carbon dioxide so that the resistivity value of the fluid is between 0.04 MΩ·cm and 5 MΩ·cm.

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9. An exposure apparatus comprising:
an illumination optical system for
illuminating a mask using light from a light source;
and

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a projection optical system for projecting a pattern of the mask onto a substrate,

wherein a fluid supplied to a space between said projection optical system and the substrate has a concentration of carbon dioxide between 0.02 ppm and 750 ppm.

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10. An exposure apparatus according to claim 9, wherein the injection unit injects the carbon dioxide at the concentration of the carbon dioxide in the fluid between 0.06 ppm and 300 ppm.

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11. An exposure apparatus comprising:
an illumination optical system for illuminating a mask using light from a light source;
and

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a projection optical system for projecting a pattern of the mask onto a substrate,

wherein a fluid supplied to a space between said projection optical system and the substrate has a resistivity value between $0.02 \text{ M}\Omega\cdot\text{cm}$ and $10 \text{ M}\Omega\cdot\text{cm}$.

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12. An exposure apparatus according to claim 11, wherein the injection unit injects the carbon dioxide so that the resistivity value between $0.04 \text{ M}\Omega\cdot\text{cm}$ and $5 \text{ M}\Omega\cdot\text{cm}$.

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13. A device manufacturing method comprising the steps of:

exposing an object using an exposure
apparatus according to any one of claims 1 to 12; and
developing the exposed object.